

Maryland School Assessment

Science

2007 Public Release

Grade 8

Acknowledgements:

A Sea Wall Just Molecule High

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New 'Time Machine' From Ice

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Session 3

Directions

Use the information below to answer Numbers 32 through 34.

Bald eagles are found in and near desert, mountain, freshwater, and marine environments throughout the United States. Bald eagles build huge nests that are usually in treetops, near areas of water. The main food source for bald eagles is fish, but the birds sometimes eat other small animals. In 1967, the bald eagle was listed as an endangered species by the Environmental Protection Agency. The widespread use of DDT was responsible for the decline in the number of eagles. DDT, a chemical commonly used to control mosquitoes, caused thinning of the eagle egg shells.

The data table below shows how the population of breeding pairs of bald eagles has changed over a 12-year period in several states.

BREEDING PAIRS OF BALD EAGLES BY STATE

State	Year 1	Year 3	Year 6	Year 9	Year 12
Maryland	123	154	201	260	319
Massachusetts	5	9	10	11	12
Michigan	174	246	287	334	405
Nebraska	0	2	10	13	29
Nevada	0	0	0	2	1

32 Which statement is the most likely reason for the large difference in the number of breeding pairs in Maryland and Nevada?

- ☐ **A** There are fewer trees in Maryland.
- ☐ **B** There are more fish in Nevada.
- ☐ **C** There are more open waters in Maryland.
- ☐ **D** There are fewer small animals in Nevada.

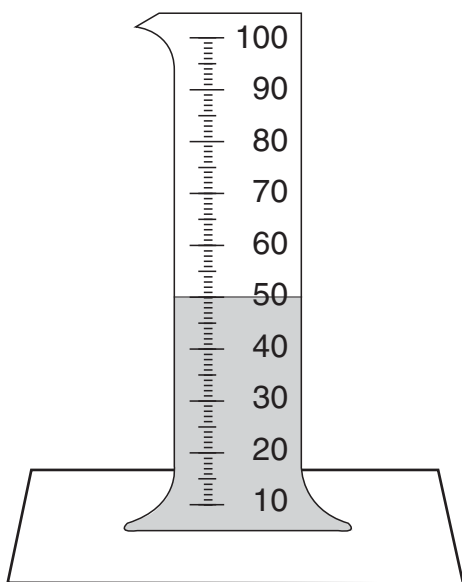
33 Which statement best explains why habitats in Michigan and Maryland support more breeding pairs than habitats in other states?

- ☐ **A** Cropland provides grain for food.
- ☐ **B** Large lakes and rivers provide food.
- ☐ **C** Mountains provide fewer places to hunt.
- ☐ **D** Grasslands provide homes for large animals.

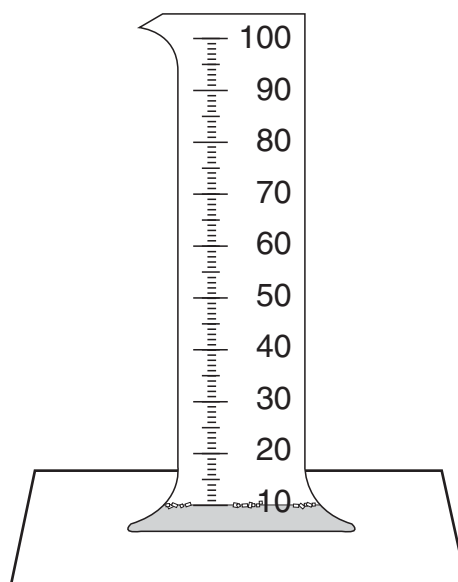
34 In which year did all states show an increase in the number of breeding pairs?

- ☐ **A** Year 3
- ☐ **B** Year 6
- ☐ **C** Year 9
- ☐ **D** Year 12

- 35** Mixtures may be separated into individual substances in a variety of ways. The graduated cylinder on Day One contains a mixture of salt and water. The graduated cylinder is left undisturbed for two days.



Day One



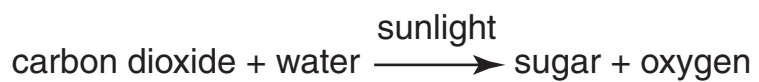
Day Three

By Day Three, a solid has formed at the bottom of the graduated cylinder. The solid is a single substance.

What process was used to separate the mixture?

- ☐ **A** sifting
- ☐ **B** filtration
- ☐ **C** evaporation
- ☐ **D** paper chromatography

Use the chemical equation below to answer Number 36.



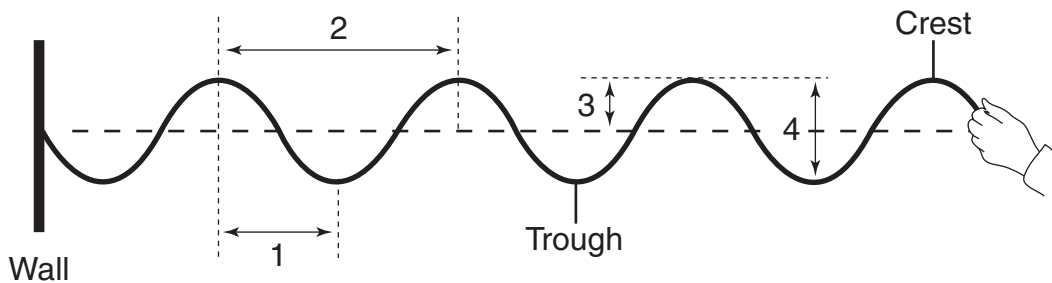
36 What process is represented by the chemical equation above?

- ☐ **A** how plants make food
- ☐ **B** how plants digest food
- ☐ **C** how animals make food
- ☐ **D** how animals digest food

Directions

Use the diagram below to answer Numbers 37 through 39.

A student produces a series of waves, as shown below.



37 Which number in the diagram represents a wavelength?

- ☐ A 1
- ☐ B 2
- ☐ C 3
- ☐ D 4

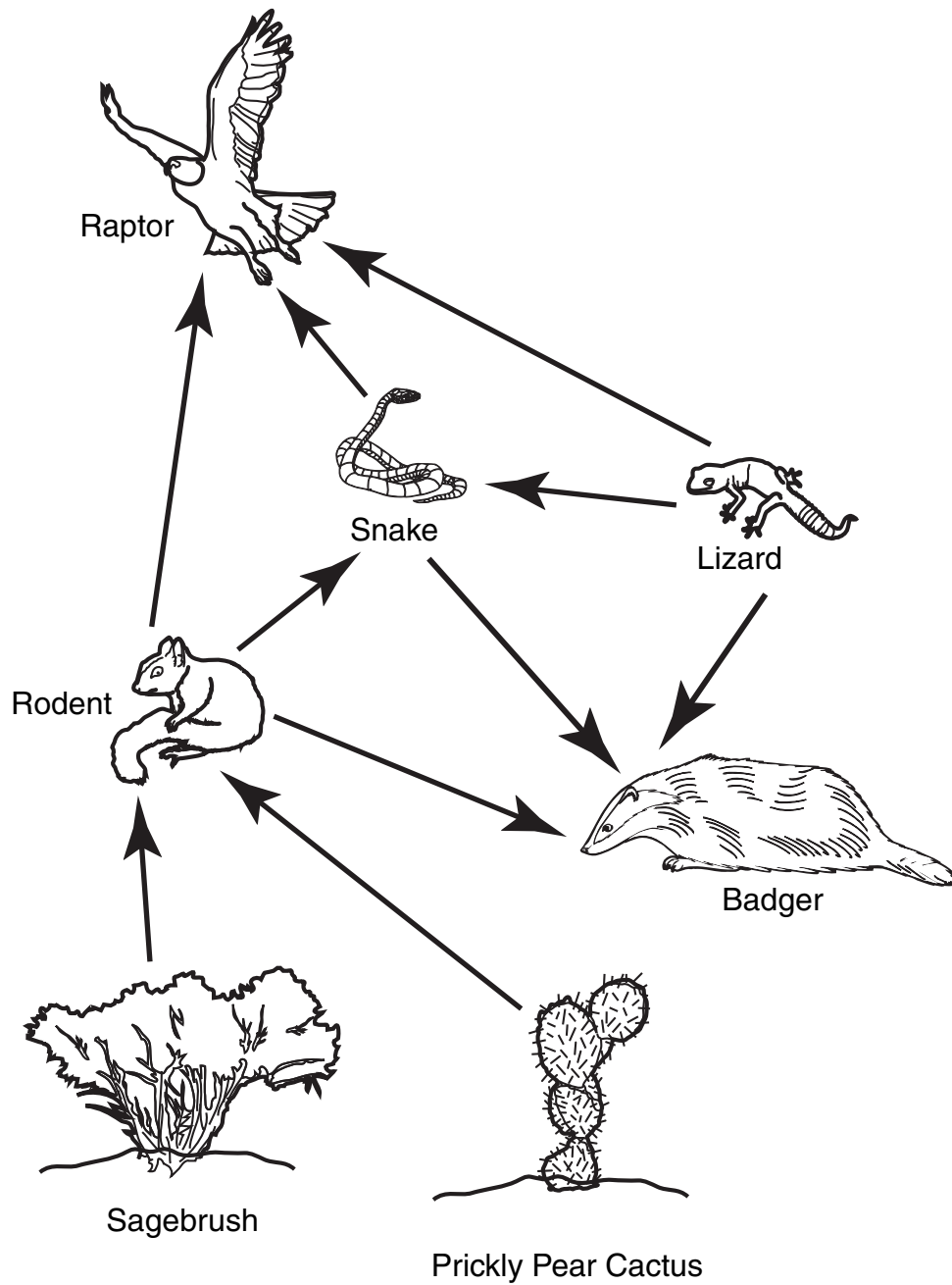
38 Which of the following changes in wave properties is a result of an increase in wavelength?

- ☐ **A** higher crests
- ☐ **B** reduced height
- ☐ **C** lower frequency
- ☐ **D** faster movement

39 Which change in wave properties increases wave amplitude?

- ☐ **A** greater length
- ☐ **B** increased height
- ☐ **C** decreased frequency
- ☐ **D** shortened wavelength

The diagram shows the relationships among organisms in an ecosystem.



Explain how organisms in this ecosystem compete for resources. In your explanation, be sure to include

- the animals that compete for the same food source
- why the plants and animals compete for water

Write your answer in the space provided.

[illegible]

- 41** The data table below includes information about how temperature affects the state of matter for three substances.

HOW TEMPERATURE AFFECTS STATES OF MATTER

Substances	State of Matter at Room Temperature (22°C)	State of Matter when Heated
Butter	Solid	Liquid (29°C)
Sugar	Solid	Liquid (186°C)
Water	Liquid	Gas (100°C)

The information in the table indicates that

- ☐ **A** the atoms in matter slow when heated
- ☐ **B** temperature physically changes matter
- ☐ **C** temperature chemically changes matter
- ☐ **D** the atoms in matter change shape when heated

42 Thunderstorms and hurricanes are examples of severe weather.

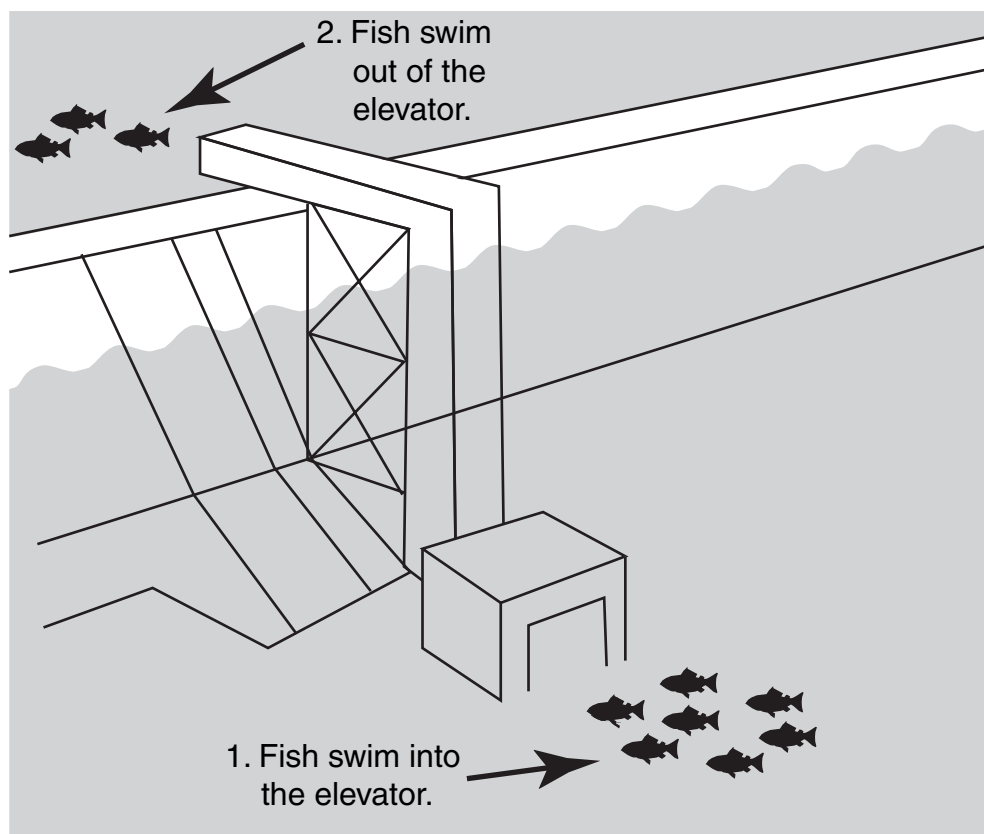
Which of these weather conditions is necessary for the formation of thunderstorms and hurricanes?

- ☐ **A** a cold rain falling to the ground
- ☐ **B** air masses combining to create a high-pressure area
- ☐ **C** winds spiraling downward and away from the center of a storm
- ☐ **D** air moving toward the center of a storm and rising into the atmosphere

Directions

Use the information and the diagram below to answer Numbers 43 through 45.

Hydroelectric dams use falling water to generate electricity. Dams affect river organisms, including the American shad, a common fish in waterways. Shad live in the ocean but swim up rivers to reproduce (spawn). Engineers have built elevators on dams for the shad and other fish. The fish swim into the elevator below the dam and are raised into the water above the dam.



43 Which human activity would most likely reduce the shad population?

- ☐ A preserving wetlands along the spawning areas
- ☐ B spilling chemical waste into the spawning areas
- ☐ C monitoring water conditions of the spawning areas
- ☐ D conducting fish-tagging programs within the spawning areas

44 Over-fishing of shad has contributed to a decline in the shad population.

Which fishing practice would most likely result in an increase in the shad population?

- ☐ A The amount of shad caught is equal to the number of shad born.
- ☐ B The amount of shad caught is less than the number of shad born.
- ☐ C The amount of shad caught is equal to the demand from humans.
- ☐ D The amount of shad caught is greater than the demand from humans.

45 What might be a likely consequence of dams to the environment downriver?

- ☐ A reduced pollution
- ☐ B increased flooding
- ☐ C reduced fish populations
- ☐ D increased drinking water

46

When sodium metal reacts with chlorine gas, sodium chloride (table salt) forms. The data table below shows information about sodium, chlorine, and sodium chloride.

PROPERTIES OF SODIUM, CHLORINE, AND SODIUM CHLORIDE

Substance	Physical Appearance	Boiling Point (°C)	Change When Added to Water
Sodium (Na)	Shiny, soft, solid metal	883	Forms new compound
Chlorine (Cl)	Greenish gas	-34	Forms new compound
Sodium chloride (NaCl)	White crystals	1,465	Dissolves in water

Which statement best describes the properties of sodium, chlorine, and sodium chloride?

- ☐ **A** All have similar chemical and physical properties.
- ☐ **B** All have different chemical and physical properties.
- ☐ **C** All have similar physical properties but different chemical properties.
- ☐ **D** All have similar chemical properties but different physical properties.

47

A doorbell contains a simple electromagnet.

Which change would most likely increase the strength of an electromagnet?

- ☐ **A** longer wires
- ☐ **B** fewer wire coils
- ☐ **C** an aluminum core
- ☐ **D** a larger power source

Substances are classified as acidic, basic, or neutral. The pH scale can be used to classify a substance.

pH LEVELS OF VARIOUS SUBSTANCES

Substances	pH	Acidic, Basic, Neutral
Lemon juice	2.0	Acidic
Vinegar	2.2	Acidic
Milk	6.6	Acidic
Pure water	7.0	Neutral
Baking soda	8.3	Basic
Ammonia	11.0	Basic
Sodium hydroxide	14.0	Basic

Which feature suggests that a substance is basic?

- ☐ **A** The pH is 0.
- ☐ **B** The pH is 7.
- ☐ **C** The pH is less than 7.
- ☐ **D** The pH is greater than 7.